

# Canon C&H Allotment

## Biological Assessment / Biological Evaluation for Plants

### I. Introduction

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The organization of this Biological Assessment (BA) / Biological Evaluation (BE) is as follows: I) Introduction, II) Pre-field Review, III) Field Reconnaissance, IV) Effects Analysis, V) Mitigation Measures, and VI) Determination. In addition, there are two Attachments to this document as follows: 1) Pertinent/cited literature, and 2) Sensitive plant species descriptions.

The policy regarding BEs and BAs is described in Forest Service manual (FSM) 2672.4 and 50 CFR 402.12, respectively. The purpose of this BA / BE is to assess the effects of the proposed project on Federally listed Threatened, Endangered, Proposed and Forest Service designated Sensitive plants. In general, the intent of the Forest Service is to not undertake actions that would lead to adverse impacts on these species.

The Analysis Area coincides with the boundary for the Canon C&H Allotment (Figure 1) and lies in the extreme western portion of the Rio Grande National Forest (RGNF).

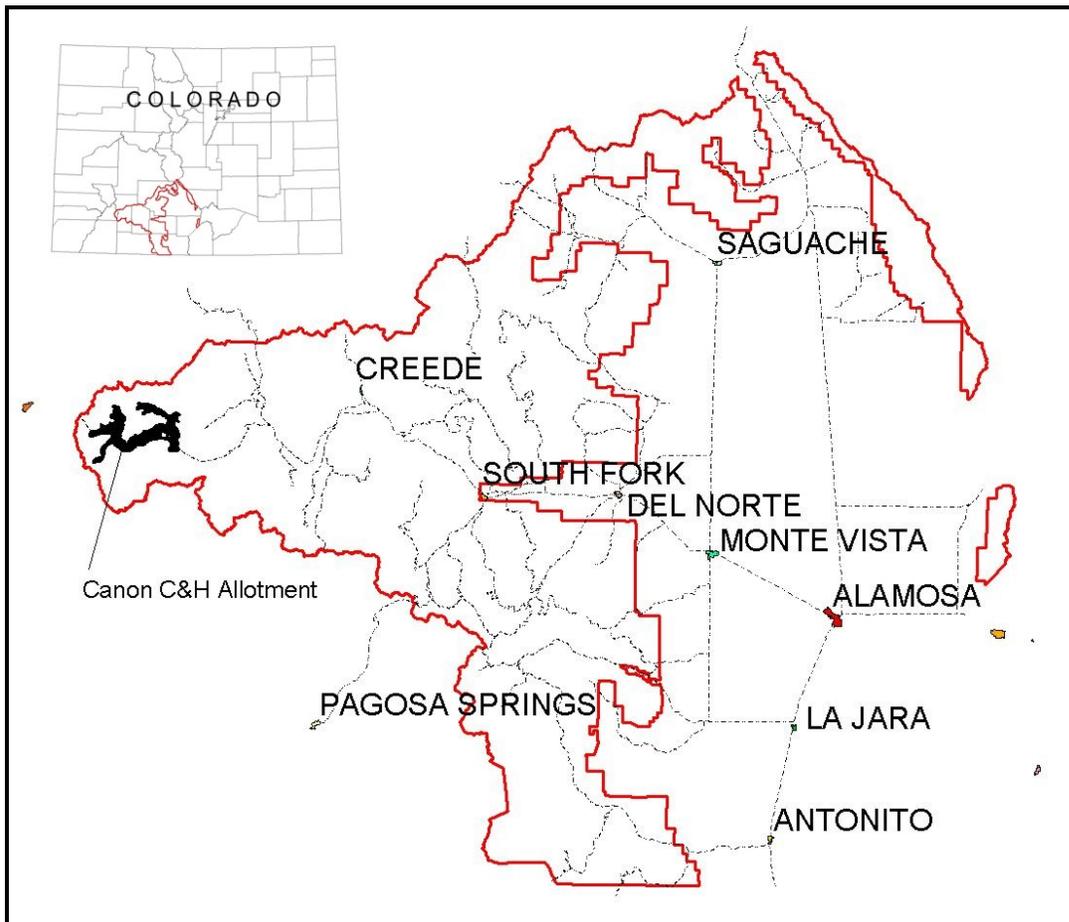


Figure 1. Canon C&H Allotment relative to the Rio Grande National Forest.

The proposed action is to implement a grazing strategy and resultant Allotment Management Plan for the Canon C&H Allotment. This action includes livestock grazing, fencing, and cattle guards. This BA / BE evaluates three alternatives (abbreviated) from Chapter 2 of the accompanying Environmental Assessment as follows:

- Alternative 1 (*Proposed Action*). One herd, seven pasture deferred grazing system. 179 cow/calf pairs from 6/26 to 10/1.
- Alternative 2. One herd, four pasture deferred grazing system (i.e., three pastures closed to livestock grazing). 104 cow/calf pairs from 6/26 to 10/1.
- Alternative 3. No livestock grazing.

The elevation of the Canon C&H Allotment ranges from approximately 9,500 to 12,260 feet.

## II. Pre-field Review

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The direction in FSM 2670 is to identify all federally listed or proposed species and Forest Service Sensitive species known or suspected to be present in the proposed project area or which the proposed project potentially affects. A preliminary review of existing information was conducted for the planning area, which included:

- 1) Review of the Regional Forester's Sensitive Plant list. A revised Sensitive Species list was issued 12/1/03 (Regional Supplement 2600-2003-1 to FSM 2670).
- 2) Review of literature pertinent to this geographic area (see Attachment 1).
- 3) Review of the Colorado Natural Heritage Program's Biological Database records for reported records of Threatened, Endangered, Proposed, Candidate, or Sensitive plant Element Occurrence Records on the Rio Grande National Forest (the latest version is dated 9/2003). A review was also made of the Colorado Natural Heritage Program's web site on the Internet at: <http://www.cnhp.colostate.edu/index.html>. The New Mexico Natural Heritage Program web site was also consulted specifically for Arizona willow (*Salix arizonica*) at: <http://nmnhp.unm.edu/>.
- 4) Review of the USDI Fish and Wildlife Service's Internet site for the most current listing of Threatened, Endangered, Proposed, and Candidate species at: <http://endangered.fws.gov/>.
- 5) Review of Forest Service files and records. Also, contact was made with Forest Service employees and other experts for reliable location information and distribution maps.

Based on the above review, the following narrative describes special-status plants known from the Rio Grande National Forest. This information is presented in two parts; first, for Threatened, Endangered, Proposed, and Candidate plants, and finally for Sensitive plants.

### **Threatened, Endangered, Proposed, and Candidate Plants**

An Endangered plant is one that is in danger of extinction throughout all or a significant portion of its range. A Threatened plant is one that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. A Proposed plant is one that has been officially proposed by the USDI Fish and Wildlife Service (FWS) for listing as threatened or endangered under the Endangered Species Act (ESA). A Candidate plant is one that the FWS has on file sufficient information on biological vulnerability and threats to support proposals to list it as endangered or threatened.

Threatened and Endangered plants are determined and listed by the USDI Fish and Wildlife Service in 50 CFR Part 17 (USDI Fish and Wildlife Service 1994; 1996; 1997; 1999; 2002). There are presently no reported records or suspected occurrences of Threatened or Endangered plants on this Forest. Threatened and Endangered plants in Colorado have unique habitats or ranges that do not occur on this Forest. There are also no plants Proposed for listing or Candidates for listing that occur on the Rio Grande National Forest (USDI Fish and Wildlife Service 2002; also see the FWS internet site at: <http://endangered.fws.gov/>.)

### **Sensitive Plants**

The USDA Forest Service (1995) defines a Sensitive plant as one that is not presently listed as Threatened or Endangered by the FWS, but a population viability concern has been identified as evidenced by:

- a) Significant current or predicted downward trends in population numbers or density.
- b) Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

The Regional Forester has identified Sensitive species for the Rocky Mountain Region (Regional Supplement 2600-2003-1 to FSM 2670). Reported locations of Sensitive plants on the Rio Grande National Forest came from Forest files, Forest Service personnel, pertinent literature, and records from the Colorado Natural Heritage Program (CNHP). Table 1 lists the Sensitive plant species that are known on the Forest. Botanical nomenclature follows the PLANTS online database (USDA Natural Resource Conservation Service 2004) and Weber and Wittmann (2001a).

Table 1. Status/Rank of Sensitive plants known from the Rio Grande National Forest.						
SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK <sup>1/</sup>	STATE RANK <sup>1/</sup>	FEDERAL STATUS <sup>1/</sup>	STATE STATUS <sup>1/</sup>	FEDERAL SENSITIVE <sup>2/</sup>
<i>Astragalus ripleyi</i>	Ripley's milk-vetch	G3	S2			FS
<i>Draba grayana</i>	Gray's Peak whitlow-grass	G2	S2			FS
<i>Draba smithii</i>	Smith's whitlow-grass	G2	S2			FS
<i>Eriophorum altaicum</i> var. <i>neogaeum</i>	Altai cottongrass	G4?T3T4	S3			FS
<i>Gilia sedifolia</i>	Stonecrop gilia	G1	S1			FS
<i>Machaeranthera coloradoensis</i>	Colorado tansy-aster	G2	S2			FS
<i>Salix arizonica</i>	Arizona willow	G2G3	S1			FS
<sup>1/</sup> For an explanation of the rank/status, see <a href="http://www.cnhp.colostate.edu/tracking/vascular.html">http://www.cnhp.colostate.edu/tracking/vascular.html</a> and select the online Metadata file for an explanation of the ranking criteria. <sup>2/</sup> FS = Forest Service						

Habitat, distribution, flowering period, palatability, and associated flora for each of the species shown in Table 1 are displayed in Attachment 2.

### III. Field Reconnaissance

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A field reconnaissance focused on known and suspected Sensitive plants on August 13, 22, 26, 27, and October 1 and 2, 1996. In addition, annual field visits to this allotment have taken place every year from 1996 to the present time. The reconnaissance traversed across various habitats on the Allotment. The search had two objectives: 1) to look at a representative sample of all the major plant community types, and 2) to focus the search on habitats known or suspected to contain Sensitive plants.

### IV. Effects Analysis

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This analysis evaluates the potential impact on Sensitive plants that may occur as a result of implementing Alternative 1, 2, or 3 proposed in Chapter 2 of the Environmental Assessment. The effects analysis is confined to the Canon C&H Allotment. The direct, indirect, and cumulative effect on each Sensitive plant is addressed below, by Alternative.

#### Alternatives 1 and 2

None of these Alternatives impact documented Sensitive plant populations based on a review of current Element Occurrence Records from the Colorado Natural Heritage Program (2003) data base. Since both of these Alternatives propose some level of livestock grazing, the effects are considered more or less equivalent for this analysis (i.e., no distinction of effects is made between these two Alternatives).

***Astragalus ripleyi*** -- A search of the Analysis Area did not reveal any *A. ripleyi* plants. It is a narrow endemic species that is not known to occur north of Conejos County, Colorado. Also, the allotment is mostly higher in elevation than the expected elevation for this species. Consequently, there are no direct, indirect, or cumulative impacts foreseen for this plant species by implementing any of these Alternatives.

***Draba grayana*** -- A search of the Analysis Area did not reveal any *D. grayana* plants. The proposed Alternatives are not expected to disturb gravelly alpine slopes and fellfields. Consequently, there are no direct, indirect, or cumulative impacts foreseen for this plant species by implementing any of these Alternatives.

***Draba smithii*** -- A search of the Analysis Area did not reveal any *D. smithii* plants. The proposed Alternatives are not expected to disturb rocky areas or talus slopes. Consequently, there are no direct, indirect, or cumulative impacts foreseen for this plant by implementing any of these Alternatives.

***Eriophorum altaicum* var. *neogaeum*** -- A search of the Analysis Area did not reveal any *E. altaicum* var. *neogaeum* plants. There is a documented record of this plant near Kite Lake. Although this is close to the Bear Creek Pasture, it is not within the allotment. The reported records of this plant on the Forest are from above 12,000 feet in elevation. There is very limited capable rangeland above 12,000 feet in the allotment, but it is possible that this plant occurs here. Direct effects could be from livestock grazing and trampling, habitat manipulation, or range improvement implementation. Palatability of this species is unknown, but due to the boggy nature of the habitat, ungulate use is probably very low to none. Typically, rhizomatous species can withstand light to moderate grazing and trampling without adverse effects. No forage use on this plant by livestock has ever been observed on the RGNF. Indirect effects may arise from changes in canopy cover of associated vegetation. The impact of this possible effect is unknown. Cumulative impacts would be a continuation of management practices (primarily livestock grazing) just as they have since the mid to late 1800's on both private and Federal lands. However, the overall range impact under proper grazing is probably much less severe today than it was historically.

***Gilia sedifolia*** -- A search of the Analysis Area did not reveal any *G. sedifolia* plants. There are two occurrences of this species above 13,000 feet near the Analysis Area. However, the Alternatives are not expected to disturb alpine rocky areas or talus slopes. Consequently, there are no direct, indirect, or cumulative impacts foreseen for this plant species by implementing any of these Alternatives.

***Machaeranthera coloradoensis*** -- A search of the Analysis Area did not reveal any *M. coloradoensis* plants. The allotment may provide habitat for this species. Direct effects could be from livestock grazing and trampling, habitat manipulation, or range improvement implementation. However, livestock palatability appears to be low, based upon available literature (Fertig 1994). Also, the sparse general nature of the habitat probably does not encourage concentrated animal use. Since the growth form is prostrate, this species should have some resistance to grazing and trampling. No forage use on this plant by livestock has ever been observed on the RGNF. Indirect effects may arise from changes in canopy cover of associated vegetation. Since *M. coloradoensis* plants are known to inhabit sparsely vegetated areas, this is probably not a significant impact. Cumulative impacts would be a continuation of management practices (primarily livestock grazing) just as they have since the mid to late

1800's on both private and Federal lands. However, the overall range impact under proper grazing is probably much less severe today than it was historically.

*Salix arizonica* -- A search of the Analysis Area did not reveal any *S. arizonica* plants. The allotment may provide riparian habitat for this species. Direct effects could be from livestock grazing and trampling, habitat manipulation, or range improvement implementation. This species is palatable to livestock. Under proper grazing and compliance with Forest Plan<sup>1</sup> riparian standards and guidelines, this species should not be negatively impacted (Arizona Willow Interagency Technical Team 1995). Indirect effects may arise from changes in canopy cover of associated vegetation. The impact of this possible effect is unknown. Cumulative impacts would be a continuation of management practices (primarily livestock grazing) just as they have since the mid to late 1800's on both private and Federal lands. However, the overall range impact under proper grazing is probably much less severe today than it was historically. Both Alternatives are consistent with the Arizona Willow Conservation Agreement and Strategy (1995) and the Strategy is still valid.

### Alternative 3

Since this Alternative proposes no livestock grazing, there would be no direct, indirect, or cumulative effect anticipated on any Sensitive plant species.

## V. Mitigation Measures

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Mitigation measures pertaining to Sensitive plants are addressed as follows (applies to Alternatives 1 and 2):

- Survey for *Eriophorum altaicum* var. *neogaeum* before implementing any range improvements within wetlands near 12,000 feet in the Analysis Area. Adjust location of activity as needed to avoid populations if they are found.
- Survey for *Machaeranthera coloradoensis* before implementing any range improvements in the Analysis Area. Adjust location of activity as needed to avoid populations if they are found.
- Survey for *Salix arizonica* before implementing any range improvements in the 10,300 to 10,700 feet elevational band in the Analysis Area. Adjust location of activity as needed to avoid populations if they are found.
- Follow mitigation measures recommended in the Environmental Assessment (EA).
- Follow Standards and Guidelines in the 1996 revised Forest Plan.

## VI. Determination

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<sup>1</sup> USDA Forest Service. 1996. Revised Land and Resource Management Plan for the Rio Grande National Forest. US Forest Service. Monte Vista, CO.

A determination is made for each category of plants as following: 1) Threatened, Endangered, and Proposed plants, and 2) Sensitive plants.

**Threatened, Endangered, and Proposed plants**

It is my determination that all Alternatives would have "**no effect**" on Threatened, Endangered, or Proposed plants. Threatened, Endangered, and Proposed plants in Colorado have unique habitats or ranges that do not occur on the Rio Grande National Forest.

**Sensitive plants**

It is my determination that Alternative 3 would have "**no impact**" on any Sensitive plant species. This determination was based on the fact that there would be no livestock grazing allowed under this Alternative.

It is my determination for *Astragalus ripleyi*, *Draba grayana*, *Draba smithii*, and *Gilia sedifolia* that Alternatives 1 and 2 would have "**no impact**." This determination is based on the conclusion that either the plants do not exist in the Analysis Area or potential habitat would not be impacted by any of the actions proposed in these Alternatives.

It is also my determination for *Eriophorum altaicum* var. *neogaeum*, *Machaeranthera coloradoensis*, and *Salix arizonica* that Alternatives 1 and 2 "**may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing or a loss of species viability rangewide.**" This determination is made based on the conclusion that potential habitat exists for these Sensitive plants in the Analysis Area and these plants could be accessible to livestock. However, implementing any livestock grazing action Alternative would likely have a minimal impact on these plants if mitigation measures along with revised Forest Plan Standards and Guidelines pertinent to livestock grazing and rangelands were followed.

<b>Prepared By:</b>	<u>/s/ Dean H. Erhard</u> Dean H. Erhard Ecologist	<u>8/25/2004</u> Date
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**Attachment 1. Pertinent/cited literature.**

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## Attachment 2. Sensitive Plant Species Descriptions.

### *Astragalus ripleyi* Barneby -- Ripley's milk-vetch

**Distribution:** An endemic, perennial forb of the lower San Luis Valley and northern New Mexico, it is known in Colorado only from Conejos County. The documented records on the Rio Grande National Forest (RGNF) are near the Conejos River and near Terrace Reservoir.

**Habitat:** This plant exhibits a high degree of habitat specificity. It is typically restricted to volcanic substrates, in open-canopy ponderosa pine / Arizona fescue savannah. It is also found along the edges of mixed coniferous forest where Arizona fescue is dominant. Northerly aspects are more frequently represented than others, but populations have been documented on all aspects. Elevation range is from 7,730 to 9,450 feet with most populations occurring between 8,100 and 9,200 feet.

**Flowering/Fruiting Period:** June-July/July-early August.

**Palatability/Animal Influence:** Plants may be palatable to livestock, deer, elk, and rabbits. In areas receiving heavy grazing pressure, robust plants are found in the protection of shrub crowns. Burt (1997; 1998; 1999) reports herbivory on this plant by wildlife, livestock, and insects.

**Associated Flora:** *Chrysothamnus vaseyi*, *Chrysothamnus parryi* spp. *parryi*, *Eriogonum racemosum*, *Festuca saximontana*, *Muhlenbergia montana*, *Festuca arizonica*, *Artemisia carruthii*, *Koeleria macrantha*, *Poa pratensis*, *Pinus ponderosa*, *Pseudotsuga menziesii*, *Picradenia richardsonii*, *Heterotheca villosa*, *Chondrosium gracile*, *Elymus longifolius*, *Castilleja linariifolia*, *Artemisia frigida*, *Tetradymia canescens*, *Oxytropis lambertii*, *Gutierrezia sarothrae*, *Heliomeris multiflora*, *Orthocarpus purpureoalbus*, *Erigeron speciosus*.

**References:** Burt (1997; 1998; 1999), Colorado Native Plant Society (1989; 1997); Colorado Natural Heritage Program (1994; 1997; 1999b; 2000a; 2003); Harrington (1954); Komarek (1994); Ladyman (2003); Lightfoot (1995); Naumann (1990); Spackman *et al.* (1997); Weber (1987; 1990); Weber and Wittmann (1996a; 2001a).

### *Draba grayana* (Rydb.) C.L. Hitchc. – Gray's Peak whitlow-grass

**Distribution:** This perennial forb is endemic to Colorado (Alamosa, Clear Creek, Gilpin, Grand, Lake, Larimer, Park, Saguache, and Summit Counties). There are documented records on the Forest from the Sangre de Cristo Range near Blanca Peak (Alamosa County), Milwaukee Peak, and Cherry Lake (Saguache County).

**Habitat:** This plant is found on gravelly alpine slopes and fellfields. The elevational range is from 11,500 to 14,000 feet.

**Flowering/Fruiting Period:** July-August/August-September.

**Palatability/Animal Influence:** There is no information on palatability of this plant. The habitat makes it relatively inaccessible to most animals. No foraging has been observed on Gray's Peak whitlow-grass plants on the RGNF.

**Associated Flora:** *Eritrichium aretiodes*,

**References:** Colorado Native Plant Society (1989; 1997); Colorado Natural Heritage Program (1994; 1997; 1998; 1999a; 1999b; 2003); Harrington (1954); Komarek (1994); Ladyman (2004b); Spackman *et al.* (1997); Weber (1987; 1990); Weber and Wittmann (1996a; 2001a).

### *Draba smithii* Gilg ex O.E. Schulz – Smith's whitlow-grass

**Distribution:** This perennial forb is endemic to Colorado (Custer, Las Animas, Mineral, and Saguache Counties). There are documented records on the Forest from the Wagon Wheel Gap, East Willow Creek, Bellows Creek, Dry Gulch and Miner's Creek areas of Mineral County and from Deadman Creek and Lake Fork of Crestone Creek in Saguache County.

**Habitat:** This plant is found in rock crevices and talus slopes in the southern mountains. The elevational range is from 8,000 to 11,000 feet.

**Flowering/Fruiting Period:** June to July.

**Palatability/Animal Influence:** There is no information on palatability of this plant. The habitat makes it relatively inaccessible to most animals. No foraging has been observed on Smith's whitlow-grass plants on the RGNF.

**Associated Flora:** *Urtica gracilis*, *Brickellia grandiflora*, *Erigeron compositus*, *Festuca arizonica*, *Heterotheca villosa*, *Artemisia frigida*, *Senecio atratus*, *Chaenactis douglasii*, *Cystopteris fragilis*, *Muhlenbergia montana*, *Apocynum androsaemifolium*, *Ribes montigenum*, *Holodiscus dumosus*.

**References:** Colorado Native Plant Society (1989; 1997); Colorado Natural Heritage Program (1994; 1997; 1998; 1999a; 1999b; 2003); Harrington (1954); Komarek (1994); Ladyman (2004a); Spackman *et al.* (1997); Weber (1987; 1990); Weber and Wittmann (1996a; 2001a).

#### ***Eriophorum altaicum* Meinsh. var. *neogaeum* Raymond -- Altai cotton-grass**

**Distribution:** This grass-like, perennial native plant is known from Alaska, British Columbia, Unita Mountains in Utah, and Colorado (Eagle, Gunnison, Hinsdale, La Plata, Park, Saguache, and San Juan Counties). There are documented sites in the Kite Lake area (12,600 feet) and one in the Cherry Lake area in the Sangre de Cristo Mountains (12,300 feet).

**Habitat:** This plant is found in subalpine and alpine wetlands and riparian areas. Spackman *et al.* (1997) reports the elevational range as 9,500 to 14,000 feet in Colorado. Documented sites on the RGNF have all been above 12,000 feet.

**Flowering/Fruiting Period:** late July to August.

**Palatability/Animal Influence:** Palatability is unknown, but due to the boggy habitat, ungulate use is probably infrequent to none. No foraging has been observed on Altai cotton-grass plants on the RGNF.

**Associated Flora:** *Psychrophila leptosepala*, *Carex aquatilis*, *Clemensia rhodantha*, *Rhodiola integrifolia*, *Bistorata bistortoides*, *Pedicularis groenlandica*.

**References:** Colorado Native Plant Society (1989; 1997); Colorado Natural Heritage Program (1994; 1997; 1998; 1999a; 1999b; 2003); Harrington (1954); Komarek (1994); Spackman *et al.* (1997); Weber (1987; 1990); Weber and Wittmann (1996a; 2001a).

#### ***Gilia sedifolia* Brandeg. -- Stonecrop gilia**

**Distribution:** This biennial, native forb is known only from a few sites in Colorado (GMUG, San Juan, and Rio Grande NFs). The known location on the Rio Grande NF is from the Pole Mountain area.

**Habitat:** Alpine environment on dry, rocky or gravelly talus of tuffaceous sandstone. Bare ground cover can be 98%.

**Flowering/Fruiting Period:** July/August.

**Palatability/Animal Influence:** There is no information on palatability of this plant.

**Associated Flora:** Extremely sparse cover of *Erysimum capitatum* and *Elymus scribneri*.

**References:** Colorado Natural Heritage Program (2003); Weber (1987; 1990); Weber and Wittmann (1996a; 2001a).

#### ***Machaeranthera coloradoensis* (Gray) Osterhout -- Colorado tansy-aster**

**Distribution:** This endemic, perennial forb of south-central Wyoming and western Colorado (Gunnison, Hinsdale, La Plata, Lake, Mineral, Park, Pitkin, Rio Grande, Saguache, and San Juan Counties). There are documented occurrences on the RGNF in the North Clear Creek area, Grayback Mountain, and in the upper Park Creek drainage.

**Habitat:** This low, prostrate, mat-plant is found on gravelly sites. It is known to grow on relatively barren slopes and ridges in mountain parks and rock outcrops up to dry tundra. Spackman *et al.* (1997) reports this plant occurring at 8,500 to 12,500 feet in elevation in Colorado.

**Flowering/Fruiting Period:** July-early August/August.

**Palatability/Animal Influence:** This plant probably is not at high risk from livestock grazing, based on field observations in Wyoming. It is suspected that the plant is probably somewhat unpalatable (Fertig 1994). Also, the sparseness of the habitat probably does not encourage animal use. There could be some risk of trampling under heavy stocking conditions. No foraging has been observed on Colorado tansy-aster plants on the RGNF.

**Associated Flora:** *Festuca arizonica*, *Danthonia parryi*, *Elymus elymoides*, *Muhlenbergia filiculmis*, *Carex obtusata*, *Artemisia frigida*, *Phlox sp.*, *Potentilla pulcherrima*, *Penstemon caespitosus*, *Eremogone fendleri*, *Pentaphylloides floribunda*.

**References:** Beatty *et al.* (2004); Colorado Native Plant Society (1989; 1997); Colorado Natural Heritage Program (1994; 1997; 1998; 1999a; 1999b; 2000a; 2003); Fertig (1994); Harrington (1954); Komarek (1994); Spackman *et al.* (1997); Weber (1987; 1990); Weber and Wittmann (1996a; 2001a).

#### ***Salix arizonica* Dorn – Arizona willow**

**Distribution:** This perennial, native shrub is a widely disjunct plant species documented in Arizona (from the White Mountains of east-central Arizona on the Apache-Sitgreaves National Forest; and from the Fort Apache Indian Reservation). It is also known from Utah (from the Dixie National Forest; the Cedar Breaks National Monument; the Fish Lake National Forest; and from the Manti-La Sal National Forest). More recently, it was found in New Mexico (near Questa on the Carson National Forest and also on the Santa Fe National Forest). This species is most recently known in Colorado only from Conejos County in the La Manga Pass vicinity.

**Habitat:** *Salix arizonica* grows in subalpine seeps, wet meadows, and along streams. Dorn (2001) believes the elevation range is restricted to 10,300 and 10,700 feet on the RGNF.

**Flowering/Fruiting Period:** June-July/June-August.

**Palatability/Animal Influence:** Plants may be palatable to cattle, elk, deer, voles, beetles, and the caterpillars of butterflies (Arizona Willow Interagency Technical Team 1995).

**Associated Flora:** *Salix wolfii*, *Pentaphylloides floribunda*, *Salix monticola*, *Psychrophila leptosepala*, *Poa pratensis*, *Phleum commutatum*, *Carex utriculata*, *Deschampsia cespitosa*, *Geum macrophyllum*, *Swertia perennis*, *Clemensia rhodantha*.

**References:** Arizona Willow Interagency Technical Team (1995); Colorado Natural Heritage Program (2003); Dorn (1997; 2001).